

Spinal Bracing

At right is Sandra Wafer, a dancer with the City Ballet of Houston, Texas. A few years ago, this young ballerina's dream of dancing seemed extremely remote; she was a victim of scoliosis, a disease characterized by progressive curvature of the spine. But Sandra Wafer escaped the crippling deformities of scoliosis by means of a new course of treatment that focuses on innovative bracing techniques as an alternative to surgical correction. The key element of the treatment is use of the Copes Scoliosis Brace, developed by orthotist Dr. Arthur L. Copes of the Copes Foundation, Baton Rouge, Louisiana.

The Copes brace, fabricated to a patient's specific need, features a novel pneumatic bladder that exerts corrective pressure on the spinal curve. **Below**, Dr. Copes is shown with a typical brace; one of the pneumatic bladders, which are technically known as force vector pads, is visible inside the brace (dark pouch at the left edge). A brace may employ as many as six pads applying pressure along the deformed spinal curve; each contains a valve system that enables the treating physician to alter the pad pressures as indicated. Through constant corrective force applied to the torso, distortion is slowly reduced or eliminated by periodic air injection into the force vector pad.

In addition to long term use of the brace, the Copes Scoliosis Program includes a three-phase exercise course, hydrotherapy, bone manipulation and muscle stimulation.



Once a patient achieves maximum correction, he or she is introduced to a retainer brace. The length of a complete program naturally varies with the individual, but usually the patient wears the corrective brace for 14 to 18 months, and correction of some degree is accomplished in more than 80 percent of the cases, according to Dr. Copes. Sandra Wafer

began treatment with two 30-plus degree spinal curves; after two years of treatment, the curves were reduced below five degrees.

Dr. Copes credits NASA technology transfer with an assist in his development of the Copes Scoliosis Brace. He was helped by the NASA/Southern University Industrial Applications Center in Baton Rouge, and the Central Industrial Applications Center, Durant, Oklahoma, whose job it is to provide information retrieval services and technical help to industrial and institutional clients. The two centers supplied Dr. Copes with more than 50 technical reports from the NASA databank and other databases; they covered a variety of subjects, such as other types of braces in use, the effects and

complications of bracing and surgery, and technology developments in rubber and plastics applicable to both the brace and the pneumatic bladder. Dr. Copes states that roughly 35 percent of these medical reports had a vital degree of utility in his development effort. He adds that the NASA input contributed significantly to the achievement of extraordinary results in hundreds of patients.

The key element of the treatment is use of a special brace developed with NASA databank input

